

CITY OF JULIAETTA (GROUND WATER) (PWS 2290018) SOURCE WATER ASSESSMENT FINAL REPORT

November 19, 2002



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for City of Juliaetta, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source.

The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.

The City of Juliaetta drinking water system consists of three active groundwater wells, one active spring, and one surface water treatment facility. The system was originally developed in the late 1800's or early 1900's and currently serves approximately 609 people through 331 connections. This report will concentrate on the ground water sources (wells and spring). A report of the surface water source, "City of Juliaetta (Surface Water) PWS# 2290018" can be acquired by contacting the Lewiston Regional Office of the DEQ at 1-887-541-3304.

Final susceptibility scores are derived from equally weighing system construction scores, hydrologic sensitivity scores (wells only), and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential Contaminants/Land Uses are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, Well #5 rated automatically high for IOCs, and moderate for VOCs, SOCs, and microbials. System construction and hydrologic sensitivity rated moderate for the well, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials. The automatically high IOC rating is due to detections of nitrates higher than the maximum contaminant level (MCL) as established by the Environmental Protection Agency (EPA).

In terms of total susceptibility, Well #7 rated moderate for IOCs, VOCs, SOCs, and microbials. System construction rated moderate and hydrologic sensitivity rated high for the well. Land use rated low for IOCs, VOCs, SOCs, and microbials.

In terms of total susceptibility, Well #9 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction rated low and hydrologic sensitivity rated high for the well. Land use rated low for IOCs, VOCs, SOCs, and microbials. The automatically high ratings are due to Ward St. and 3rd Street existing within 50 feet of the well.

In terms of total susceptibility, Cox Spring rated moderate for IOCs and low for VOCs, SOC, and microbials. System construction rated low and land use scores were moderate for IOCs, and low for VOCs, SOC, and microbials.

No VOCs, SOC, or microbials have ever been detected in the wells or spring. Trace concentrations of the IOC nitrate has been detected in Well #7 and Cox Spring, and in Well #5 and Well #7 after 1994. Prior to 1994, nitrate concentrations were detected as high as 18.2 mg/L (milligrams per liter) in Well #5 and 8.67 mg/L in Well #9. The MCL for nitrates is 10 mg/L. Traces of the IOCs sulfate, sodium, fluoride, and natural radiation have been detected in tested water, but concentrations have been significantly below MCLs.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well or spring sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the City of Juliaetta, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). Actions should be taken to keep a 50-foot radius circle clear of all potential contaminants from around the wellheads and 100 feet around the spring. Any contaminant spills within the delineations should be carefully monitored and dealt with. As much of the designated protection areas are outside the direct jurisdiction of the City of Juliaetta, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies please contact the Lewiston Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF JULIAETTA, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The local community, based on its own needs and limitations, should determine the decision as to the amount and types of information necessary to develop a drinking water protection program. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Juliaetta drinking water system consists of three active groundwater wells, one active spring, and one surface water treatment facility. The system was originally developed in the late 1800's or early 1900's and currently serves approximately 609 people through 331 connections. This report will concentrate on the ground water sources (wells and spring). A report of the surface water source, "City of Juliaetta (Surface Water) PWS# 2290018" can be acquired by contacting the Lewiston Regional Office of the DEQ at 1-887-541-3304.

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Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with the University of Idaho to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the aquifer of the Clearwater Uplands in the vicinity of the City of Juliaetta wells. The computer model used site specific data, assimilated by the University of Idaho from a variety of sources including operator input, local area well logs, and hydrogeologic reports (detailed below).

Hydrogeologic Setting

The town of Juliaetta is located in the northern margin of the Clearwater Embayment – the easternmost extent of the Columbia River Basalt Group (CRBG). The area is underlain by pre-Tertiary, crystalline, basement rocks. Surficial sediments of the Palouse Loess and more recent alluvium cover the basalt in most of the area.

The CRBG forms the major aquifers in the area with well yields above 100 gallons per minute (gpm). Fractures in the basement rock, which are encountered approximately 600 ft. below ground in the town of Juliaetta provide some water. However, this unit has a low hydraulic conductivity and wells exclusively in basement rock usually produce less than 5 gpm. The shallow depth to basement rock, which limits the thickness of the CRBG in Juliaetta is attributed to a ridge of basement rock (Smith, 1984).

The conceptual hydrogeologic model is based on interpretations presented in Smith (1984) for the town of Juliaetta, Ralston (1994) for the town of Kendrick, available well logs, and published geologic maps for the area. Bedrock geology is based on the geologic map of the Pullman quadrangle at a scale of 1:250,000 (Rember and Bennett, 1979).

All three wells and the spring appear to draw their water from the Grande Ronde Formation of the CRBG. With the exception of Juliaetta Well #5, it is likely that all of the Juliaetta's wells terminate in the Grand Ronde formation. Well #5 fully penetrates both the Grande Ronde and Imnaha Formations of the CRBG and encounters basement rock at 618 ft depth (Smith, 1984). Juliaetta Well #7 is located near the surface projection of the Potlatch Creek Fault (Smith 1984).

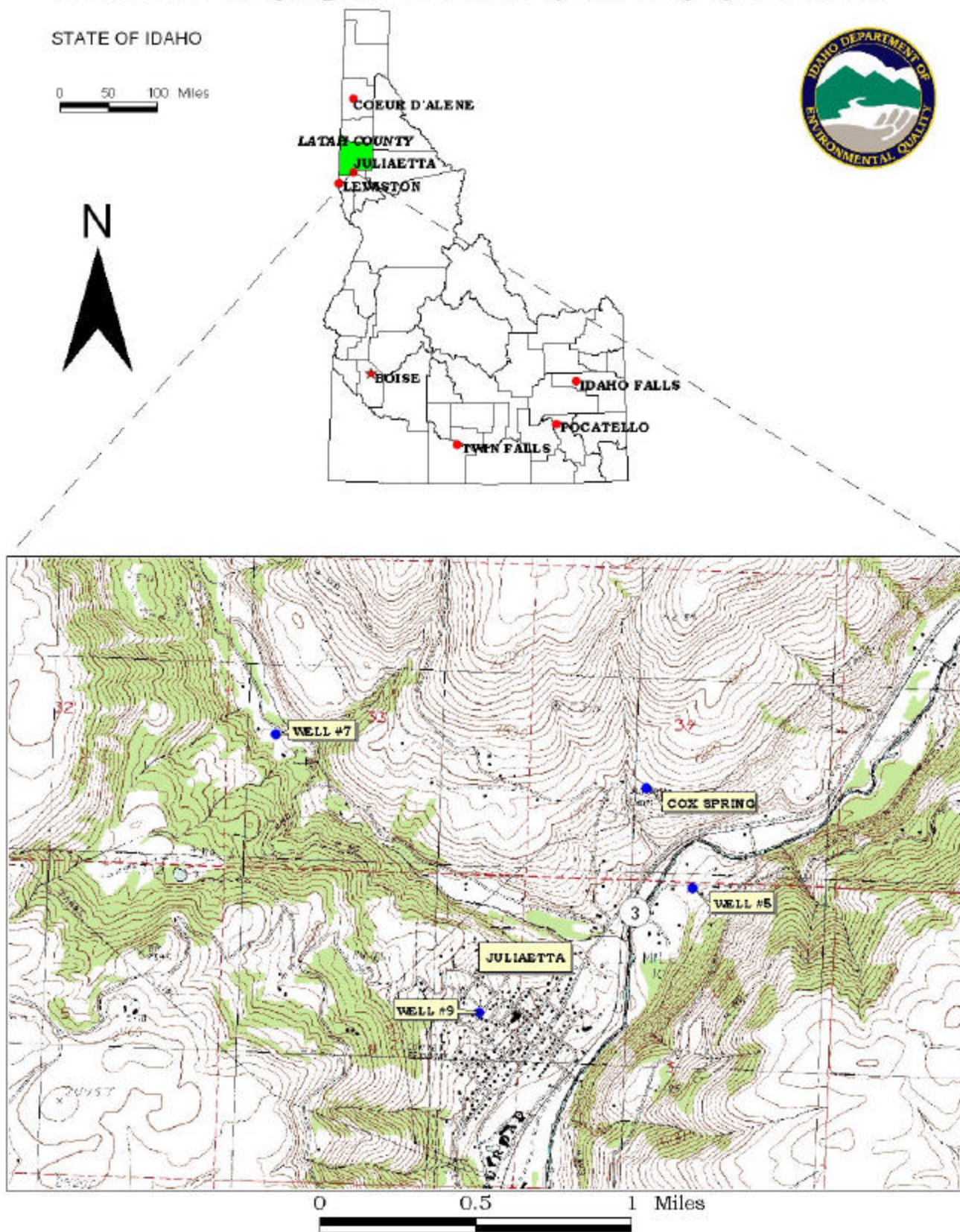
Based on elevation and stratigraphy, the sources are located in the lower basalt aquifer of the Grande Ronde (Juliaetta Well #5 in both the Grande Ronde and Imnaha Formations) Smith (1984). Static water level data for the source wells are scarce; however, the available data indicate that static water levels are close to that of the Potlatch River, with deeper wells showing an increasing head with depth. The elevation of the river is approximately 1,100 ft in Juliaetta. The static water level in Well #7 is approximately 100 feet higher than the other Juliaetta wells, and Smith concludes that this well is affected by the nearby Potlatch Creek Fault, which creates a preferential pathway for ground water flow along the fault.

Aquifer test data are available for Well #5 and Well #7. The aquifer test conducted using Well #7 showed high yields, a high transmissivity, and a close interconnection with Middle Potlatch Creek. Based on aquifer test data, static water levels, and interpretations of Smith (1984), Well #7 appears to be hydrologically distinct from other sources, likely due to the fault zone. Therefore, Well #7 is modeled separately Well 5 and Well #9. Cox Spring was also modeled with Well #5 and Well #9. Well #7 is modeled separately because there is only one test point near it; therefore, the direction of ground water flow is not known.

Neighboring private wells were used for test points. Information on test points was obtained from a search of the Idaho Department of Water Resources database available on the internet. The locations of the test points are limited to information supplied on the well logs, typically the quarter-quarter section. Therefore, the accuracy of the test point elevation and the static water elevation is dependent upon the accuracy of the driller's log and the relief in the quarter-quarter section.

The delineated source water assessment areas for Well #5, Well #9, and Cox Spring can best be described as corridors that extend approximately 3.5 miles in a north by northeasterly direction and are approximately 0.5 miles wide at their widest points (Figure 2, 4, 5). Well #7's delineation is a circle approximately 0.6 miles in diameter, that exists only on the west side of Middle Potlatch Creek. The actual data used by the University of Idaho in determining the source water assessment delineation areas is available from DEQ upon request.

FIGURE 1. Geographic Location of the City of Juliaetta



Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area and the surrounding area of the City of Juliaetta sources contains some urban activity, however most of the delineation exists within undeveloped range land or woodland, except for Well #3, which has just over 50% of its delineation designated as agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in March and April 2002. The first phase involved identifying and documenting potential contaminant sources within the City of Juliaetta source water assessment areas (Figure 2, 3, 4, 5, and Table 1, 2, 3, 4) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ.

The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area. No additional potential contaminant sources were identified by the system's operator.

The delineated source water assessment areas of the City of Juliaetta wells contain two feedlots, in addition to Burlington Northern Railroad, the Potlatch River, Brady Gulch, a landing strip, and Middle Potlatch Creek crosses at least one of the delineations. These sources can contribute leachable contaminants to the aquifer in the event of an accidental spill, release, or flood.

Table 1. City of Juliaetta, Well #5, Potential Contaminant/Land Use Inventory.

Site	Description of Source ¹	TOT ² Zone	Source of Information	Potential Contaminants ³
	Burlington Northern Railroad	0-3 YR	GIS Map	IOC, VOC, SOC, Microbial
	Potlatch River	0-3 YR	GIS Map	IOC, VOC, SOC, Microbial
	Landing Strip	3-6 YR	GIS Map	IOC, VOC, SOC
	Brady Gulch	6-10 YR	GIS Map	IOC, VOC, SOC

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 2. City of Juliaetta, Well #7, Potential Contaminant/Land Use Inventory.

Site	Description of Source ¹	TOT ² Zone	Source of Information	Potential Contaminants ³
	Middle Potlatch Creek	0-10 YR	GIS Map	IOC, VOC, SOC, Microbial

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 3. City of Juliaetta, Well #9, Potential Contaminant/Land Use Inventory.

Site	Description of Source ¹	TOT ² Zone	Source of Information	Potential Contaminants ³
1	Feed Lot	0-3 YR	Database Search	IOC, Microbials
2	Feed Lot	6-10 YR	Database Search	IOC
	Highway 3	0-6 YR	GIS Map	IOC, VOC, SOC, Microbial

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

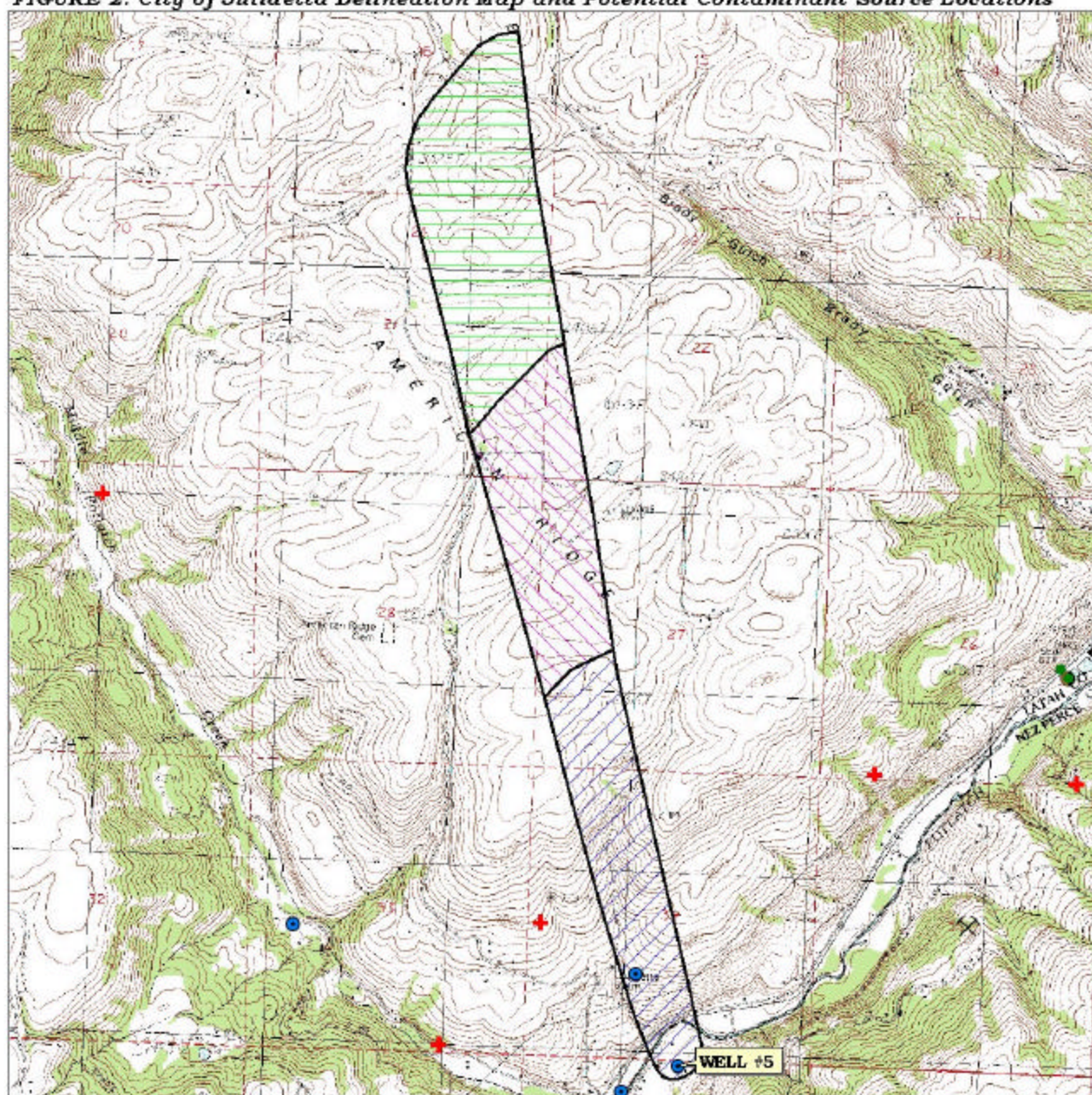
Table 4. City of Juliaetta, Cox Spring, Potential Contaminant/Land Use Inventory.

Site	Description of Source ¹	TOT ² Zone	Source of Information	Potential Contaminants ³
	None			

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

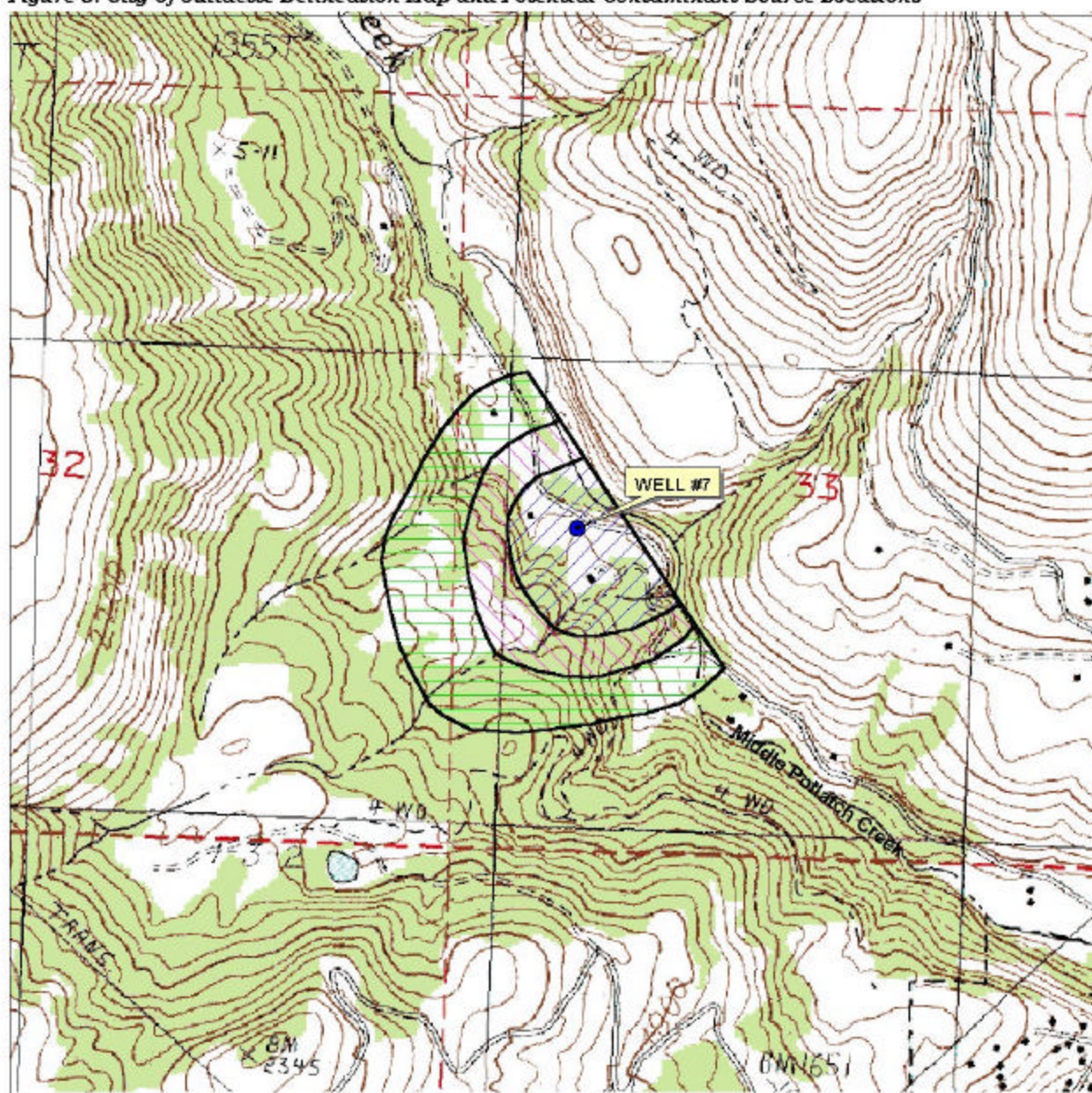
³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

FIGURE 2. City of Juliaetta Delineation Map and Potential Contaminant Source Locations



PWS# 2290018
WELL #5

Figure 3. City of Juliaette Delineation Map and Potential Contaminant Source Locations

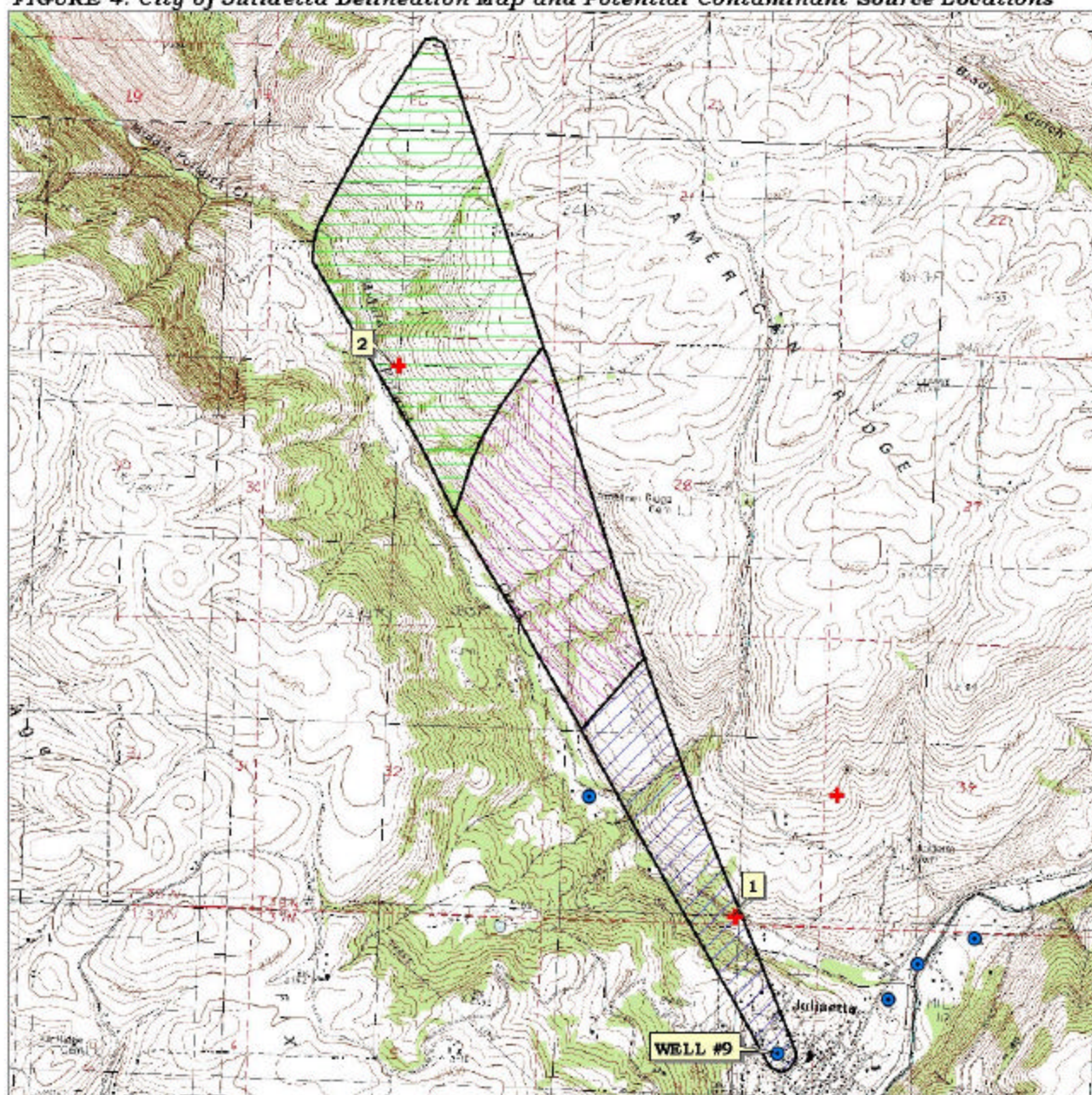


0 0.1 0.2 0.3 0.4 0.5 Miles



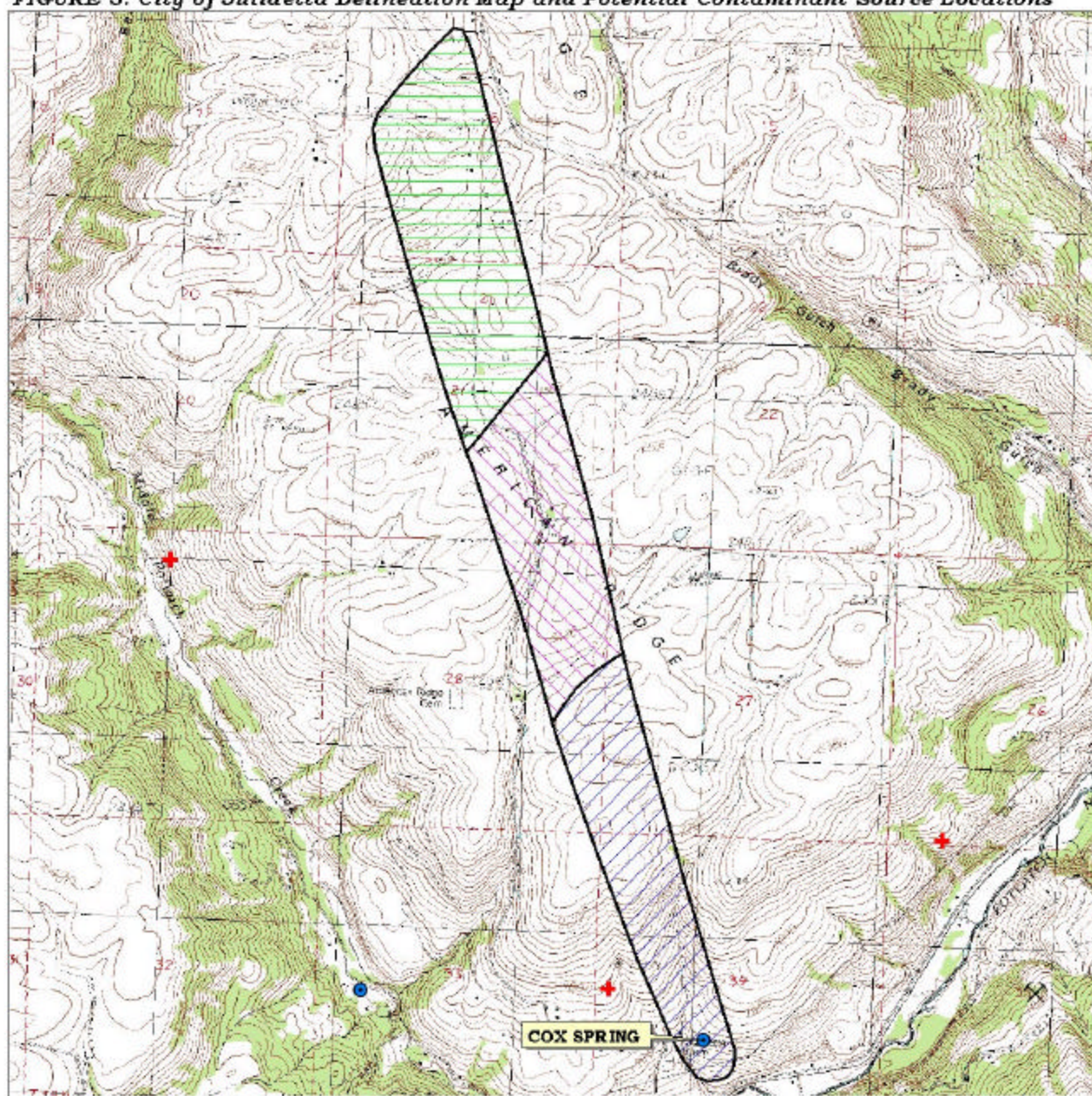
PWS# 2290018
WELL #7

FIGURE 4. City of Juliaetta Delineation Map and Potential Contaminant Source Locations



PWS# 2290018
WELL #9

FIGURE 5. City of Juliaetta Delineation Map and Potential Contaminant Source Locations



**PWS# 2290018
COX SPRING**

Section 3. Susceptibility Analyses

Each well or spring's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well or spring is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquiclude) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination. Hydrologic sensitivity is not included as part of a spring's rating.

Hydrologic sensitivity rated moderate for Well #5, and high for Well #7 and Well #9. In each of the wells, the vadose zone is composed of permeable materials, the water table is less than 300 feet below ground level, and an aquiclude is not present. According to the National Resource Conservation Service (NRCS), the soils within Well #5's delineation are poorly- to moderately drained, positively affecting its score, and the soils in Well #7 and Well #9's delineations are classified as moderately- to highly- drained, negatively affecting their scores.

System Construction

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey was conducted in 2000 for the system.

Well #5 rated moderate for construction. The well was constructed in 1974 and is 758 feet deep. The well is cased with a 12 inch in diameter and 0.25 inch thick steel casing to 38 feet, and an 8-inch casing 0.25 inches thick to 223 feet. Both casings are seated into basalt, the deeper layer being called “soft, gray basalt” by the well driller. A cement grout annular seal was installed as deep as the 8-inch casing. An open hole extends from 223 feet to 758 feet, it’s pump is set at 256 feet and the water table is 30 feet deep. The well is located outside of a 100 year floodplain, it’s highest production comes from more than 100 feet below the static water depth, and according to the sanitary survey, the wellhead and surface are maintained. However, the deeper casing does not extend into a low permeability unit, and both casings are thinner than current regulations allow.

Well #7 rated moderate for construction. The well was constructed in 1979 and is 222 feet deep. A 12-inch casing 0.375 inches thick extends 80 feet deep into broken rock, a 10-inch casing 0.375 inches thick extends 99 feet deep into black basalt, and an 8-inch casing 0.25 inches thick extends to 220 feet deep into brown sandy clay. Static water level is 60 feet deep and perforations exist in the casing from 140 feet to 180 feet, and from 190 feet to 200 feet. The well is located outside of the 100 year floodplain and the wellhead and surface seal are maintained and the casing extends to a low permeability unit. Increasing the score was the fact that the highest production comes from less than 100 feet below static water level and the annular seal’s depth is unknown.

Well #9 rated moderate for construction. The well was originally 255 feet deep, but reconstructed in 1987 and is now 253 feet deep with a pump set at 248 feet deep. A 10-inch in diameter 0.25 inch thick casing was placed to 45 feet into firm basalt and sealed with cement grout. Static water level has been falling, and it is now at 200 feet. The well is located outside of the 100 year floodplain, and its casing and annular seal extend into a low permeability unit. The score was increased because the well’s highest production is not more than 100 feet below static water level, and the wellhead is missing a vent.

Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. An 8-inch casing requires a 0.322 inch thickness, 10-inch casings should be 0.365 inches, and 12-inch casings should be 0.375 inches. As such, the wells were assessed an additional point in the system construction rating.

Spring Construction

Spring construction scores are determined by evaluating whether the spring has been constructed according to Idaho Code (IDAPA 58.01.08.04) and if the spring's water is exposed to any potential contaminants from the time it exits the bedrock to when it enters the distribution system. If the spring's intake structure, infiltration gallery, and housing are located and constructed in such a manner as to be permanent and protect it from all potential contaminants, is contained within a fenced area of at least 100 feet in diameter, and is protected from all surface water by diversions, berms, etc., then Idaho Code is being met and the score will be lower. If the spring's water comes in contact with the open atmosphere before it enters the distribution system, it receives a higher score. Likewise, if the spring's water is piped directly from the bedrock to the distribution system or is collected in a protected spring box without any contact to potential surface-related contaminants, the score is lower.

Cox Spring rated low for construction. It has been producing water since the 1930's and produces approximately 9 gallons per minute. The spring is enclosed in a concrete structure with an overlapping access hatch and the area surrounding it is fenced. The water is chlorinated before it is sent to the distribution system. As the spring is fenced, for the sake of this analysis, it will be assumed to be at least 100 feet in radius. It will also be assumed that the concrete spring box is tight against the hillside, and because the hillside is relatively steep, it is also assumed precautions were taken to divert any surface runoff away from the spring box.

Potential Contaminant Source and Land Use

Well #5 and Cox Spring rated moderate for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), SOCs (i.e. pesticides), and low for microbials. Well #7 and Well #9 rated low for all four contaminant categories. The number and location of potential contaminant sources within the delineations contributed to the land use scores.

Final Susceptibility Ranking

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. In this case Well #5 received an automatically high susceptibility to IOCs due to detections of nitrate higher than MCL's, and Well #9 received automatically high susceptibility ratings for all categories due to Ward St. and 3rd Street existing within the well's 50 foot sanitary setback distance. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking.

Table 5. Summary of City of Juliaetta Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #5	M	M	M	M	L	M	H*	M	M	M
Well #7	H	L	L	L	L	M	M	M	M	M
Well #9	H	L	L	L	L	M	H**	H**	H**	H**
Cox Spring	NA	M	L	L	L	L	M	L	L	L

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

H* = Automatic high susceptibility due to detections of the IOC nitrate above maximum contaminant levels (MCLs)

H** = Automatic high susceptibility due to Ward St. and 3rd Street existing within 50 feet of the well

NA = not applicable

Susceptibility Summary

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Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Juliaetta, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. No chemicals should be stored or applied within the 50-foot radius of the wellheads or 100 feet of the spring. As much of the designated protection areas are outside the direct jurisdiction of the City of Juliaetta, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation encompasses urban and commercial land uses. Public education topics could include proper lawn and garden care practices, hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Lewiston Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Lewiston Regional DEQ Office (208) 799-4370

State DEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, mlharper@idahoruralwater.com, Idaho Rural Water Association, at 208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Department of Environmental Quality. 2002. Sanitary Survey for City of Juliaetta.

IDAPA 58.01.08, Idaho Rules for Public Drinking Water Systems, Section 004.

Ralston Hydrologic Services, Inc. 2001. Ground Water and Well Analysis for the City of Bovill, Idaho.

Ralston, D.R.; 1994. Analysis of Ground Water Development Potential for Kendrick, Idaho, Report prepared for the City of Kendrick, 16 p.

Rember, W.C., and Bennett, E.H.; 1979. Geologic Map of the Pullman Quadrangle, Idaho, Idaho Bureau of Mines and Geology, Moscow, ID.

Smith, D.A.; 1984. Hydrogeology in the Vicinity of Juliaetta, Idaho. Univ. Idaho M.S. Thesis; 134 p.

Attachment A

City of Juliaetta

Susceptibility Analysis
Worksheets

Formulas used to determine Susceptibility Analysis Final Scores

Formula for Well Sources

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

Formula for Spring Sources

1. VOC/SOC/IOC/ Final Score = (Potential Contaminant/Land Use X 0.818) + System Construction
2. Microbial Final Score = (Potential Contaminant/Land Use X 1.125) + System Construction

Final Susceptibility Scoring:

- 0 - 7 Low Susceptibility
- 8 - 15 Moderate Susceptibility
- ≥ 16 High Susceptibility

1. System Construction

SCORE

Drill Date	08/01/1974	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		3

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A

	IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2
Farm chemical use high	YES	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A	2	2	4	2

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	2	2	2	2
(Score = # Sources X 2) 8 Points Maximum		4	4	4	4
Sources of Class II or III leacheable contaminants or	YES	3	1	1	
4 Points Maximum		3	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	25 to 50% Irrigated Agricultural Land	2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		9	7	7	6

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

Cumulative Potential Contaminant / Land Use Score

	19	17	19	8
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4. Final Susceptibility Source Score

11 10 11 10

5. Final Well Ranking

High Moderate Moderate Moderate

1. System Construction

SCORE

Drill Date	09/24/1979	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		2	2	2	2

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		2	2	2	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		1	1	1	0

Cumulative Potential Contaminant / Land Use Score

7 5 7 2

4. Final Susceptibility Source Score

11 11 11 11

5. Final Well Ranking

Moderate Moderate Moderate Moderate

1. System Construction

SCORE

Drill Date	07/22/1987	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	YES	0
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		3

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	3	1	1	2
(Score = # Sources X 2) 8 Points Maximum		6	2	2	4
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		6	2	2	4

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		1	0	0	0

Cumulative Potential Contaminant / Land Use Score

9 2 4 4

4. Final Susceptibility Source Score

11 9 10 11

5. Final Well Ranking

High High High High

1. System Construction

SCORE

Intake structure properly constructed

YES

0

Is the water first collected from an underground source

Yes=spring developed to collect water from beneath the ground; lower score

YES

0

No=water collected after it contacts the atmosphere or unknown; higher score

Total System Construction Score

0

2. Potential Contaminant Source / Land Use

IOC
ScoreVOC
ScoreSOC
ScoreMicrobial
Score

Land Use Zone 1A

RANGELAND, WOODLAND, BASALT

0

0

0

0

Farm chemical use high

YES

2

0

2

IOC, VOC, SOC, or Microbial sources in Zone 1A

NO

NO

NO

NO

NO

Total Potential Contaminant Source/Land Use Score - Zone 1A

2

0

2

0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)

NO

0

0

0

0

(Score = # Sources X 2) 8 Points Maximum

0

0

0

0

Sources of Class II or III leacheable contaminants or

YES

4

0

0

4 Points Maximum

4

0

0

Zone 1B contains or intercepts a Group 1 Area

NO

0

0

0

0

Land use Zone 1B Greater Than 50% Irrigated Agricultural Land

4

0

0

0

Total Potential Contaminant Source / Land Use Score - Zone 1B

8

0

0

0

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present

NO

0

0

0

Sources of Class II or III leacheable contaminants or

YES

1

0

0

Land Use Zone II Greater Than 50% Irrigated Agricultural Land

2

0

0

Potential Contaminant Source / Land Use Score - Zone II

3

0

0

0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present

NO

0

0

0

Sources of Class II or III leacheable contaminants or

YES

1

0

0

Is there irrigated agricultural lands that occupy > 50% of

YES

1

0

0

Total Potential Contaminant Source / Land Use Score - Zone III

2

0

0

0

Cumulative Potential Contaminant / Land Use Score

15

0

0

0

4. Final Susceptibility Source Score

12

0

0

0

5. Final Well Ranking

Moderate

Low

Low

Low